

JP 06181695

DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Industrial Application] This invention relates to the feed additive granule for an aquatic animal and land animals. The core granule which contains L-ascorbic acid-2-phosphoric acid or the salts of those especially by with oil and fat and a mean particle diameter of 5-30 micrometers neutrality by difficulty solubility. By covering with acidity using an easily soluble substance, it is related with the feed additive granule for animals for keeping stable L-ascorbic acid-2-phosphoric acid or the salts of those in the various feed in which the manufacturing conditions of a crumble pellet, a moist pellet, etc. differ.

[0002]

[Description of the Prior Art] L-ascorbic acid is one of the nutrients indispensable to the collagen synthesis of an animal.

It is added by an aquatic animal, land animal feed, etc. for the purpose, such as alimentation and stress management.

L-ascorbic acid hydroxylates the proline residue of a collagen precursor in the living body, and is participating in collagen formation deeply by changing into hydroxyproline residue. Therefore, when L-ascorbic acid runs short, the character of the mucopolysaccharide contained in the intercellular substance of connective tissue changes, as a result, it becomes impossible for a collagenous fiber to maintain a healthy state, and, pathologically, it will present scurvy condition, such as bleeding from a blood vessel, bony hypoplasia, and poor development of epidermal tissue.

[0003] These days, L-ascorbic acid is added by feed for the purpose, such as stress management, also at feed for pets like the feed for land animals, such as a fowl, a swine, a cow, etc. which are said to carry out the autosynthesis of the L-ascorbic acid in a body, and a dog, a cat, a rabbit, and birds. This is because the addition to the feed of L-ascorbic acid has an effect in stress mitigation to stress originating in the breeding environment of an animal, such as temperature and high-density breeding.

[0004] It is said that addition of L-ascorbic acid to the inside of feed is effective also as prevention of the hepatopathy resulting from the peroxy lipid in feed, etc., etc., the radical supplementary agent in blood, and an adjuvant.

[0005] Thus, although L-ascorbic acid is one of the very important nutrients for breeding of an economic animal and it has been conventionally added by animal feed, There is a problem that L-ascorbic acid is [that it is very easy to oxidize] unstable, and most will be decomposed during feed manufacture and storage, and more various stabilization technique than before has been used to this. The method of adding L-ascorbic acid and its salts with organic acid and an anti-oxidant, if such art is divided roughly, Perform special coating to L-ascorbic acid or its salts, and physically from oxygen or the L-ascorbic acid dialytic ferment in feed. How to protect L-ascorbic acid (Japanese Patent Application No. 57-88103, Japanese Patent Application No. 56-103564), The method of making the activity as L-ascorbic acid reveal, etc. have been used in the living body by replacing the endiol group of L-ascorbic acid chemically, compounding a stable derivative chemically [L-ascorbic acid], and adding this to feed.

[0006]

[Problem(s) to be Solved by the Invention]In L-ascorbic acid, the method of adding the salts into feed with an anti-oxidant, and the method of performing special coating and protecting L-ascorbic acid and its salts from oxidation. Like a crumble pellet or a moist pellet, although there is little decomposition of L-ascorbic acid in the inside of a manufacturing process about the feed 70 ** or less comparatively manufactured at low temperature, in the coating article of these L-ascorbic acid, the stability in the inside of pelleted feed is bad. Starch in a raw material is pregelatinized and manufactured environmental protection measures and by making a pellet raw material into an elevated temperature (110 ** - 200 **) by laborsaving etc. in the extrusion pellet (EP feed) which demand is increasing to urgency by these days. Therefore, in these methods, there is a problem that most of L-ascorbic acid or its salts will decompose by the conditions of the high temperature high pressure in a manufacturing process. When it coats firmly in order to prevent decomposition in a manufacturing process, absorption of L-ascorbic acid is barred in proportion to it, and there is a problem of being discharged by the outside of the body with excrement.

[0007]In order to solve these problems, the method of adding the derivative of L-ascorbic acid in feed in recent years was developed. What is stabilized by the substitution of the hydroxyl of the 2nd place or the 3rd place of L-ascorbic acid to oxidation as a stable derivative chemically [L-ascorbic acid] is most suitable, and there are sulfate ester of the 2nd place or the 3rd place and phosphoric ester as a typical example. Remaining without almost disassembling these derivatives also by EP feed manufacturing process is checked. As an example which added these derivatives in feed, The example which added L-ascorbic acid-2-sulfate ester to aquatic animal feed (Halver, etc., Federation proc., 31, 705-1972), The example (JP,61-175142,A, 62-198615, 62-285759) which added L-ascorbic acid-2-monophosphoric ester to feed, the example (Japanese Patent Application No. 61-503565) which added L-ascorbic acid-2-phosphosphate to feed, etc. are publicly known.

[0008]However, there are some serious problems also in these L-ascorbic acid stabilization derivatives. For example, L-ascorbic acid-2-sulfate ester, Although activity is shown in fishes and crustacean (Halver, N.Y. Ac. sci., 285, 81, 1975), in a guinea pig and the monkey. L-ascorbic acid activity is not shown (AKURIN and Am.J. clin. Nutr., 29, 825, 1976). The activity of L-ascorbic acid-2-sulfate ester, In channel catfish, there is that it is more remarkably [than L-ascorbic acid-2-phosphoric ester] low (proc. 3Int. Symp. on Feeding and Nutr. in Fish, 1989) etc., There is not activity common to all the living things, and it is necessary to check an effect according to the kind of animal about the addition to feed.

[0009]On the other hand, as a fault of the L-ascorbic acid-2-phosphoric ester said for there to be high L-ascorbic acid activity in almost all living things, With metal and bacteria of a certain kind, such as the enzyme and acid which exist in biogenic substances, such as a germ of the wheat which may be added by feed, and fish meal in wheat bran and a feed raw material, etc., and Fe. Disassembly of ascorbic acid-2-phosphoric acid is promoted and there is a problem that the concentration of L-ascorbic acid-2-phosphoric acid falls. When added by feed, such as milk replacers, such as a moist pellet, a cow, and a swine, it generated in many cases, and these problems had the problem that ascorbic acid-2-phosphoric acid was stably unobtainable in feed.

[0010]

[Means for Solving the Problem] In order that this invention persons may keep stable L-ascorbic acid-2-phosphoric acid or salts of those in feed containing the quality of an ester species decomposition product of L-ascorbic acid-2-phosphoric acid in feed, A result of having considered stabilization in feed containing the quality of a decomposition product of L-ascorbic acid-2-phosphoric acid, L-ascorbic acid-2-phosphoric acid or salts of those Fatty acid or fatty acid ester of the carbon numbers 12-22, One sort or two sorts or more of mixtures chosen from with "plant and animal oil fat with a melting point of not less than 40 ** or hardening "plant and animal oil fat, and a melting point of not less than 40 ** Low Wacks, Depending on the case, using 2-hydroxycarboxylic acid, its salt, or a chelating agent, L-ascorbic acid-2-phosphoric acid. Corn a core granule containing those salts and this granule Or fatty acid or fatty acid ester of the carbon numbers 12-22, The L-ascorbic acid-2-phosphoric acid which difficulty solubility covered neutrally using a with one sort or two sorts or more of mixtures chosen from with "plant and animal oil fat with a melting point of not less than 40 ** or hardening "plant and animal oil fat, and a melting point of not less than 40 ** Low Wacks, and a mean particle diameter of 5-30 micrometers acid and easily soluble substance. Or a feed additive granule containing the salts, It found out keeping stable L-ascorbic acid-2-phosphoric acid or salts of those in feed which the quality of a decomposition product of L-ascorbic acid-2-phosphoric acid contains, and this invention was completed.

[0011] Hereafter, this invention is explained still in detail. With the L-ascorbic acid-2-phosphoric acid in this invention, or salts of those. For example, L-ascorbic acid-2-monophosphoric acid, L-ascorbic acid-2-pyrophoric acid, It is mentioned by simple substances, such as L-ascorbic acid-2-Tori phosphoric acid and L-ascorbic acid-2-polyphosphoric acid, a mixture, or complex, and with the salts. Salts, such as alkaline metals, such as sodium, potassium, magnesium, calcium, and aluminum, or alkaline-earth metals, and tertiary amine, are mentioned.

[0012] Fatty acid or fatty acid ester of the carbon numbers 12-22 in this invention, With one sort or two sorts or more of mixtures chosen from with "plant and animal oil fat with a melting point of not less than 40 ** or hardening "plant and animal oil fat, and a melting point of not less than 40 ** Low Wacks. For example, as "plant and animal oil fat or hardening "plant and animal oil fat with a melting point of not less than 40 **, dense low and Kalna Barrow, haze wax, etc. are mentioned considering palm oil, beef tallow, 54 hardening beef tallow, and beef tallow extreme hydrogenated oil, lard, hydrogenated castor oil, hardening oleum rapae, etc. as Low Wacks.

[0013] As an easily soluble substance, with acidity by difficulty solubility neutrally, For example, calcium carbonate, tribasic calcium phosphate, dibasic calcium phosphate, the 3rd magnesium phosphate, zinc phosphate, aluminium phosphate, a calcium silicate, calcium pyrophosphate, magnesium carbonate, lead carbonate, cobalt carbonate, etc. are mentioned. Although these can be used at the time of a granulation or covering and things also with the arbitrary crystal form are used, a plate crystal is preferred when using for covering.

[0014] With 2-hydroxycarboxylic acid in this invention, or its salt, a carbon number of show acid, lactic acid, citrate, malic acid, etc. is mentioned for an alkaline metal or alkaline earth metal salt, such as organic acid of 1-20 or potassium of those, and sodium, etc.

[0015]With a chelating agent in this invention, phosphoric acid, such as polyphosphoric acid, metaphosphoric acid, pyrophoric acid, monophosphoric acid, and Tori methanoic acid, ethylene-diamine-tetraacetic acid (EDTA), its alkaline metal, alkaline-earth metals, etc. are mentioned, for example. Although these can be used arbitrarily, 10^{-9} of L-ascorbic acid-2-phosphoric acid or salts of those - a twice $[10^{-5} \text{ weight}]$ as many range as this are suitable for an addition of 2-hydroxycarboxylic acid and chelating agents.

[0016]Arbitrary methods that a granulation method of a feed additive granule containing L-ascorbic acid-2-phosphoric acid or salts of those is publicly known are used. For example, the spray cooling method, an agitation granulation method, an extrusion granulation method, a compression granulation method, etc. are mentioned. An excipient by which normal use is carried out at this time can be used.

[0017]A coating method of these core granules receives a core granule containing L-ascorbic acid-2-phosphoric acid or salts of those using tumbling granulator, an agitation granulation machine, etc., The above-mentioned oil and fat are added as melting liquid, and an enveloping layer is made to form, adding by turns and carrying out cooling solidification of the acid and easily soluble substance with a mean particle diameter of 5-30 micrometers by difficulty solubility, neutrally. It is more desirable to use $[\text{acidity}]$ that plate crystal for an easily soluble substance by difficulty solubility by this time neutrality.

[0018]The amount of oil and fat used at the time of a granulation of a feed additive granule containing L-ascorbic acid-2-phosphoric acid or salts of those and the amount of oil and fat used in an enveloping layer are 10 % of the weight or more to the completion granule whole quantity. In less than 10 % of the weight, the stability of L-ascorbic acid-2-phosphoric acid or salts of those is inferior, and it is ineffective. When it uses extremely so much, there are problems, like a content of L-ascorbic acid-2-phosphoric acid or salts of those decreases.

[0019]A size of these granules is so preferred that it is small, and is usually 0.5 mm or less preferably 1 mm or less.

[0020]In this invention, oil and fat in a granulation or an enveloping layer are for preventing permeation of elution of L-ascorbic acid-2-phosphoric acid or salts of those, quality of an oxide from feed, and moisture various enzymes in feed. 2-hydroxycarboxylic acid, its salt, or a chelating agent, Preventing decomposition by the oxygen of L-ascorbic acid-2-phosphoric acid or L-ascorbic acid, and dehydroascorbic acid, an easily soluble substance acts with acidity by difficulty solubility neutrally as an elution accelerator of the L-ascorbic acid-2-phosphoric acid in inside of a living body, or salts of those.

[0021]

[Example]Hereafter, an example and a comparative example explain this invention still in detail. However, this invention is not limited by the following examples.

[0022](1) The example 1 L-ascorbic-acid-2-magnesium phosphate 450g, the dibasic calcium phosphate 330g, the calcium carbonate 40g, and the beef tallow extreme hydrogenated oil 180g were fed into the agitation granulation machine, the melting heating granulation was performed, and the granule of 20-42 meshes was obtained. 800 g of obtained granules were supplied to the agitation granulation machine, and were made into 50 ** of temperature of goods, and 240 g of plate crystals of dibasic calcium phosphate and $[\text{the fused beef tallow extreme hydrogenated oil } 160\text{g and}] 2$

monohydrate were added by turns, and it covered. The stability test in the inside of various feed was done to this granule.

[0023](2) The example 2 L-ascorbic-acid-2-magnesium phosphate 450g, the dibasic calcium phosphate 240g, the calcium carbonate 40g, the calcium lactate 90g, and the beef tallow extreme hydrogenated oil 190g were fed into the agitation granulation machine, the melting heating granulation was performed, and the granule of 20-42 meshes was obtained. 800 g of obtained granules were supplied to the agitation granulation machine, and were made into 50 ** of temperature of goods, and 240 g of plate crystals of dibasic calcium phosphate and [the fused beef tallow extreme hydrogenated oil 160g and] 2 monohydrate were added by turns, and it covered. The stability test in the inside of various feed was done to the obtained granule.

[0024](3) 450 g of example 3 L-ascorbic-acid-2-calcium phosphate, the dibasic calcium phosphate 240g, the calcium carbonate 40g, 90 g of potassium metaphosphate, and the beef tallow extreme hydrogenated oil 185g were fed into the agitation granulation machine, the melting heating granulation was performed, and the granule of 20-42 meshes was obtained. 800 g of obtained granules were supplied to the agitation granulation machine, and were made into 50 ** of temperature of goods, and 240 g of plate crystals of dibasic calcium phosphate and [the fused beef tallow extreme hydrogenated oil 160g and] 2 monohydrate were added by turns, and it covered. The stability test in the inside of various feed was done to this granule.

[0025](4) The example 4 L-ascorbic-acid-2-sodium phosphate 450g, The dibasic calcium phosphate 240g, the calcium carbonate 40g, the calcium lactate 45g, 45 g of potassium metaphosphate, and the beef tallow extreme hydrogenated oil 185g were fed into the agitation granulation machine, the melting heating granulation was performed, and the granule of 20-42 meshes was obtained. 800 g of obtained granules were supplied to the agitation granulation machine, and were made into 50 ** of temperature of goods, and 240 g of plate crystals of dibasic calcium phosphate and [the fused beef tallow extreme hydrogenated oil 160g and] 2 monohydrate were added by turns, and it covered. The stability test in the inside of various feed was done to this granule.

[0026](5) 300 g of comparative example 1 L-ascorbic acid, the dibasic calcium phosphate 480g, the calcium carbonate 40g, and the beef tallow extreme hydrogenated oil 180g were fed into the agitation granulation machine, the melting heating granulation was performed, and the granule of 20-42 meshes was obtained. The stability test in the inside of various feed was done to the obtained granule.

[0027](6) as contrast of the stability test in the inside of the comparative example 2 - 4 feed -- L-ascorbic acid (comparative example 2), L-ascorbic acid calcium (comparative example 3), and L-ascorbic acid-2-magnesium phosphate (comparative example 4) -- the independent stability test was done.

[0028](7) Each feed was added so that an examination granule and feed might be 0.05% (completion standard) as L-ascorbic acid, and it pelletized by mixing the method ** sardine minced meat and powder assorted mixed feed of a stability test in the inside of moist pellet feed at a rate of 1:1, and mixing well. The powder assorted-mixed-feed presentation at this time was shown in Table 1.

[0029]

[Table 1]

表 1 配合飼料の原料組成

原 材 料 名	配合割合 (%)
魚 粉	68
油 粕	7
小 麦 粉	10
米 ぬ か	10
C M C	3
ビタミン*1、ミネラル*2、ビール酵母	2

*1 L-アスコルビン酸を除いたハルバービタミン組成

*2 マツカラム塩

(HPLC条件)

カラム: NUCLEOSIL ODS-5C₁₈

移動相: 0.1M KH₂PO₄ (pH3.8)

温 度: 40℃

検 出: UV-257nm

注入量: 20μl

流 速: 1.2ml/min

[0030]** On the basis of L-ascorbic acid at the time of combination, or an L-ascorbic acid-2-phosphoric ester content, the result was shown in Table 2 in quest of the survival rate 24 hours after room temperature neglect.

** Analysis of L-ascorbic acid or L-ascorbic acid-2-phosphoric ester was conducted by the conditions of the high performance chromatography appended to Table 1.

[0031]

[Table 2]

表2 飼料中での安定性試験結果

項 目	主 成 分	被覆の 有 無	含 量 (%)	24時間後 残存率 (%)
実施例 1	L-アスコルビン酸 -2-リン酸マグネシウム	有	30	80
実施例 2	L-アスコルビン酸 -2-リン酸マグネシウム	有	27.3	85
実施例 3	L-アスコルビン酸 -2-リン酸カルシウム	有	28.6	87
実施例 4	L-アスコルビン酸 -2-リン酸ナトリウム	有	28.6	86
比較例 1	L-アスコルビン酸	有	100	42
比較例 2	L-アスコルビン酸	無	100	5
比較例 3	L-アスコルビン酸カルシウム	無	100	10
比較例 4	L-アスコルビン酸 -2-リン酸マグネシウム	無	100	26

[0032](8) An examination granule and feed were made the feed raw material of the presentation of the stability test following table 3 in crumble feed with L-ascorbic acid, it added 0.05% (considering it as a completion standard), and the crumble feed for aquatic animals was produced according to the usual commercial feed manufacturing process.

[0033]

[Table 3]

表3 飼料の原料組成

原材料の区分	配合割合 (%)	原 材 料 名
動物性飼料	52	魚 粉
穀 類	30	小 麦 粉
植物油かす類	8	大豆油かす
そうこう類	7	米 ぬ か
その他、ビタミン、ミネラル	3	飼料用酵母、ビタミン、ミネラル*

*ビタミンA、ビタミンD₃、ビタミンE、ビタミンK₃、

ビタミンB₁、ビタミンB₂、ビタミンB₆、ビタミンB₁₂、

ニコチン酸、パントテン酸、葉酸コリン、イノシトール、

ビオチン、硫酸マンガン、硫酸鉄、炭酸亜鉛、硫酸銅、

硫酸コバルト、ヨウ素酸カルシウム、硫酸マグネシウム、

エトキシキン

[0034]Each loss on drying (105 **, value of 3 hours) of the feed after preparation was just over or below 7%. This feed was saved in the greenhouse and the survival rate in feed 100 days after making the addition at the time of combination into 100% was searched for with the following analytical method. The result was shown in Table 4.

[0035]

[Table 4]

表4 クランプル飼料中での安定性

項 目	主 成 分	被覆の 有 無	100日後の 残存率 (%)
実施例 1	Ｌ－アスコルビン酸 －２－リン酸マグネシウム	有	95
実施例 2	Ｌ－アスコルビン酸 －２－リン酸マグネシウム	有	96
実施例 3	Ｌ－アスコルビン酸 －２－リン酸カルシウム	有	94
実施例 4	Ｌ－アスコルビン酸 －２－リン酸ナトリウム	有	97
比較例 1	Ｌ－アスコルビン酸	有	51
比較例 2	Ｌ－アスコルビン酸	無	35
比較例 3	Ｌ－アスコルビン酸カルシウム	無	40
比較例 4	Ｌ－アスコルビン酸 －２－リン酸マグネシウム	無	89

(APMの分析)

飼料サンプルをメノウ鉢ですり潰し、その0.3gを精秤して水10mlを加え激しく振盪した。これを遠心分離して上澄みを得、メンブランフィルター(0.45ミクロン)で濾過した後、次の高速液体クロマトグラフ(HPLC)法条件で定量分析した。

(HPLC条件)

カラム: NUCLEOSIL ODS-5C₁₈移動相: 0.1M KH₂PO₄ (pH3.8)

温 度: 40℃

流 速: 1.2ml/min

検 出: UV-257nm

注入量: 20μl

[0036](9) The examination granule and the sample were made the feed raw material of the presentation of Table 5 of the stability test following in EP feed with L-ascorbic acid, it added 0.05% (considering it as a completion standard), and EP feed for aquatic animals was produced by the 2 axis extruder according to the usual commercial feed manufacturing process.

[0037]

[Table 5]

表5 飼料の原料組成

原 材 料 名	配合割合 (%)
魚 粉	52
大 豆 油 粕	8
小 麦 粉	30
米 ぬ か	7
ビタミン*1、ミネラル*2、飼料用酵母	3

*1 レーアスコルビン酸を除いたハルパービタミン組成

*2 マッカラム塩

[0038] This feed was saved at the room temperature and the survival rate in feed 30 days after making the addition at the time of combination into 100% was searched for with the following analytical method. The result was shown in Table 6.

(Analysis of APM) The feed sample was mashed in the agate bowl, the 0.3 g was weighed precisely, 10 ml of water was added, and it shook violently. This was centrifuged and the supernatant fluid was obtained, and after filtering with a membrane filter (0.45 NIKURON), it analyzed on the high-speed liquid chromatograph (HPLC) method conditions of the next table 6.

[0039]

[Table 6]

表 6

項 目	主 成 分	被覆の 有 無	30日後の 残存率(%)
実施例 1	Ｌ－アスコルビン酸 －２－リン酸マグネシウム	有	90
実施例 2	Ｌ－アスコルビン酸 －２－リン酸マグネシウム	有	88
実施例 3	Ｌ－アスコルビン酸 －２－リン酸カルシウム	有	92
実施例 4	Ｌ－アスコルビン酸 －２－リン酸ナトリウム	有	90
比較例 1	Ｌ－アスコルビン酸	有	7
比較例 2	Ｌ－アスコルビン酸	無	5
比較例 3	Ｌ－アスコルビン酸カルシウム	無	9
比較例 4	Ｌ－アスコルビン酸 －２－リン酸マグネシウム	無	87

(HPLC条件)

カラム: NUCLEOSIL ODS-5C18

移動相: 0.1M KH₂PO₄ (pH3.8)

温 度: 40℃

流 速: 1.2ml/min

検 出: UV-257nm

注入量: 20μl

[0040](10) An examination granule and feed were made into L-ascorbic acid, and were added 0.05% (considering it as a completion standard), and it blended with the feed raw material of the presentation of Table 7 of the assorted-mixed-feed following for breast-feeding term calves according to the usual commercial feed manufacturing process.

[0041]

[Table 7]

表 7 飼料の原料組成

原 材 料 名	配 合 割 合 (%)
全 脂 粉 乳	6 0
脱 脂 粉 乳	1 0
ミ ル ク カ ゼ イ ン	7
ミ ル ク ホ エ イ	5
大 豆 粉	5
グ リ コ ー ル	1 0
ビ タ ミ ン ・ ミ ネ ラ ル	3

[0042] This feed was saved to the temperature of 40 **, the standard was asked for the survival rate of 30 days after for L-ascorbic acid at the time of combination, or L-ascorbic acid-2-phosphoric ester magnesium, and that result was shown in Table 8. Analysis of L-ascorbic acid or L-ascorbic acid magnesium was conducted with high performance chromatography by the conditions of (9).

[0043]

[Table 8]

表 8

項 目	主 成 分	被覆の 有 無	3 0 日 後 の 残 存 率 (%)
実施例 1	Ｌ－アスコルビン酸 －２－リン酸マグネシウム	有	8 7
実施例 2	Ｌ－アスコルビン酸 －２－リン酸マグネシウム	有	7 5
実施例 3	Ｌ－アスコルビン酸 －２－リン酸カルシウム	有	8 4
実施例 4	Ｌ－アスコルビン酸 －２－リン酸ナトリウム	有	8 2
比較例 1	Ｌ－アスコルビン酸	有	3 3
比較例 2	Ｌ－アスコルビン酸	無	1 0
比較例 3	Ｌ－アスコルビン酸カルシウム	無	2 5
比較例 4	Ｌ－アスコルビン酸 －２－リン酸マグネシウム	無	5 3

[0044]

[Effect of the Invention] The feed additive granule which contains the obtained L-ascorbic acid-2-phosphoric acid or the salts of those by this invention is stable in various feed, can prescribe an L-ascorbic acid ingredient for the patient effective in an animal, can be contributed to the productive efficiency of an animal, and upgrading, and is industrially

useful art.

CLAIMS

[Translation done.]

CLAIMS

[Claim(s)]

[Claim 1] L-ascorbic acid-2-phosphoric acid or salts of those Fatty acid or fatty acid ester of the carbon numbers 12-22, Using one sort or two sorts or more of mixtures chosen from with "plant and animal oil fat with a melting point of not less than 40 °C or hardening "plant and animal oil fat, and a melting point of not less than 40 °C Low Waxes, L-ascorbic acid-2-phosphoric acid. Corn a core granule containing the salts and Or fatty acid or fatty acid ester of the carbon numbers 12-22, "plant and animal oil fat or hardening "plant and animal oil fat with a melting point of not less than 40 °C, A feed additive granule containing the L-ascorbic acid-2-phosphoric acid difficulty solubility covering with acidity using a with one sort or two sorts or more of mixtures chosen from Low Waxes with a melting point of not less than 40 °C, and a mean particle diameter of 5-30 micrometers easily soluble substance neutrally, or salts of those.

[Claim 2] A feed additive granule containing L-ascorbic acid-2-phosphoric acid, the L-ascorbic acid-2-phosphoric acid according to claim 1 in which a core granule containing the salts contains 2-hydroxycarboxylic acid, its salt, or a chelating agent, or salts of those.